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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,590	02/15/2005	Naohiro Matsunaga	019519-455	6557

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EXAMINER	
HON, SOW FUN	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/524,590	MATSUNAGA ET AL.	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Withdrawn Rejections

1. The 35 U.S.C. 102(b) and 103(a) rejections of claims 1-14 are withdrawn due to Applicant's cancellation of said claims.

New Rejections

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 15-18, 22-25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (US 6,383,559) in view of Oka (US 5,909,314).

Regarding claim 15, Nakamura teaches an antireflection film comprising: a transparent support 13 (column 4, lines 1-5); and as an outermost layer, a low refractive index layer (11, column 4, lines 1-5, Fig. 1) containing a fluorine-containing polymer (microparticles 41, column 5, lines 35-36, fluorine-containing shell polymer, column 11, lines 40-50), wherein the low refractive index layer contains at least one inorganic fine particle (41, column 5, lines 35-36, 50-51) having an average particle size of 50% of the thickness of the low refractive index layer (11, Fig. 1), which is within the claimed range of 30 to 100%. Nakamura teaches that the inorganic fine particles have a particle size within the range of 5 to 200 nm (column 5, lines 43-44), wherein the lower limit of the particle size range is a particle size of less than 25% of the thickness of the low

refractive index layer (thickness of the low refractive layer is in the range of 50 to 400 nm, column 4, lines 30-35). Nakamura fails to teach that there is a particle distribution of two sets of fine inorganic particles, wherein the smaller inorganic fine particles serve the function of helping prevent the larger inorganic fine particles from settling.

However, Oka teaches an antireflection film (abstract) wherein silica fine particles having a particle size of not more than 10 % of the size of the larger particles (silica having a particle diameter of not more than 0.5 microns is different the silica having a particle diameter of about 5 microns commonly used as the conventional matte material, column 9, lines 33-43), are added for the purpose of preventing the larger particles from settling (matte material likely to settle in the resin composition, column 9, lines 28-38) during formation of the film.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided at least one silica fine particle having a particle size of not more than 10% of the size of the larger inorganic fine particles in the low refractive index layer, and hence less than 25% of the thickness of the low refractive index layer in the antireflection film of Nakamura, in order to prevent the larger inorganic fine particles from settling during formation of the antireflection film, as taught by Oka.

Regarding claim 16, Nakamura teaches that the antireflection film has at least one hard coat layer between the transparent support and the low refractive index layer (intermediate layer such as a hard coating layer provided on the support, column 15, lines 55-57).

Regarding claim 17, Nakamura teaches that the inorganic particle is a silica fine particle (column 22, lines 25-28).

Regarding claim 18, Nakamura teaches that the lower limit of the silica inorganic fine particle size is 5 nm (column 5, lines 43-44), which is within the claimed range of from 1 to 20 nm.

Regarding claim 22, Nakamura in view of Oka fails to disclose that the hard-coat layer is a light-diffusing layer, which has a scattered light intensity at 30° of 0.01 to 0.2% based on the light intensity at an exit angle of 0° in a scattered light profile by a goniophotometer.

However, Nakamura teaches that the average scattered light intensity of the anti-reflection film is 0.3% (reflectance, column 21, lines 15-18). Thus it would have been obvious to one of ordinary skill in the art to have optimized the process of making the antireflection film so that the hard coat layer is a light-diffusing layer which has a scattered light intensity at 30°, within the claimed range of 0.01 to 0.2% based on the light intensity at an exit angle of 0° in a scattered light profile by a goniophotometer, for the purpose of obtaining the desired average scattered light intensity of 0.3% for the antireflection film.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have optimized the process of making the antireflection film of Nakamura in view of Oka, to obtain a hardcoat layer which is a light-diffusing layer with a scattered light intensity at 30°, within the claimed range of 0.01 to 0.2% based on the light intensity at an exit angle of 0° in a scattered light profile by a

goniophotometer, in order to provide the desired average scattered light intensity of 0.3% for the antireflection film, as taught by Nakamura.

Regarding claim 23, Nakamura teaches that the antireflection film comprises at least one high refractive index layer (34, column 5, lines 1-2, Fig. 3) between the transparent support (film 33, column 5, line 1, Fig. 3) and the low refractive index layer (33, column 5, line 7, Fig. 3), wherein the high refractive index layer is a layer having a refractive index of 1.7 to 2.2 which is within the claimed range of 1.55 to 2.40, and mainly comprising: titanium dioxide (column 24, lines 21-23); and an inorganic fine particle containing zirconium (column 14, lines 39-43).

Regarding claim 24, Nakamura teaches that the low refraction index layer has a refractive index of 1.20 to 1.40 (column 3, lines 25-28), which is within the claimed range of 1.20 to 1.49.

Regarding claim 25, Nakamura teaches a polarizing plate whose one surface is the anti-reflection film (column 18, lines 7-13). A polarizing plate comprises a polarizer and two protective films, one on each side. Thus, the polarizing plate of Nakamura comprises a polarizer and two protective films of the polarizer, wherein one of the two protective films of the polarizer is the antireflection film.

Regarding claim 27, Nakamura teaches an image display device comprising the anti-reflection film, and the polarizing plate comprising the anti-reflection film (liquid crystal display, column 18, lines 14-17), wherein the reflection or phenomenon of displaying a background view on the surface [of the display] was greatly reduced

(column 18, lines 13-17). Thus, the anti-reflection film is the outermost surface of the display.

3. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Oka as applied to claims 15-18, 22-25, 27 above, and further in view of Yasuda (US 6,210,858).

Nakamura in view of Oka teaches the antireflection film comprising the low refractive index layer wherein at least one inorganic fine particle having an average particle size with the range of 30 to 100% of the thickness of the low refractive index layer, and wherein the low refractive index layer further comprises at least one silica particle having a particle size of less than 25% of the thickness of the low refractive index layer, as discussed above. In addition, Nakamura teaches that the refractive index of the particle is generally 1.25 to 1.45 (column 4, lines 22-25, silicon dioxide, column 8, line 50). Nakamura fails to teach that at least one of the silica particles in the low refractive index layer is a hollow silica fine particle having a refractive index of from 1.17 to 1.40.

However, Yasuda teaches an antireflection film comprising inorganic fine particles of hollow silica (porous, column 1, lines 65-67), wherein the refractive index is decreased by micro voids (column 2, lines 32-35), for the purpose of lowering the refractive index of the silica particles.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a hollow silica fine particle having a refractive index of from 1.17 to 1.40, as one of the silica particles in the low refractive

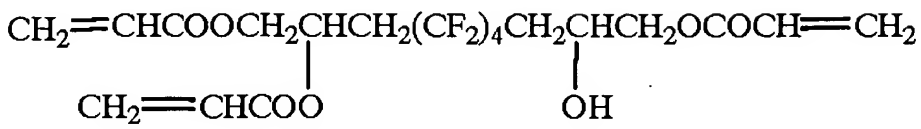
index layer of Nakamura, in order to provide the desired reduction in refractive index of the low refractive index layer, as taught by Yasuda.

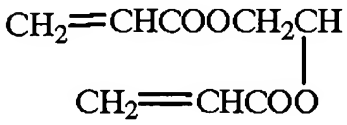
4. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Oka as applied to claims 15-18, 22-25, 27 above, and further in view of Yoshida (US 6,254,973).

Nakamura in view of Oka, teaches a fluorine-containing polymer contained in the low refractive index layer of the antireflection film, as discussed above. Nakamura in view of Oka, fails to teach that the fluorine-containing polymer is a copolymer (P) having a main chain consisting of only carbon atoms, wherein the copolymer comprises a fluorine-containing vinyl monomer polymerization unit; and a polymerization unit having a (meth)acryloyl group on the side chain, let alone that the copolymer (P) is represent by Applicant' formula 1.

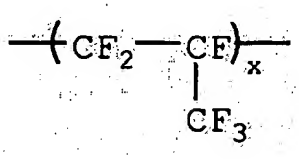
However, Yoshida teaches an antireflection film (reflection reducing film, abstract) formed from polymerizing the fluorine-containing monomer (curing, abstract, formula (16), column 13, lines 36-42) shown on the next page.

(16)

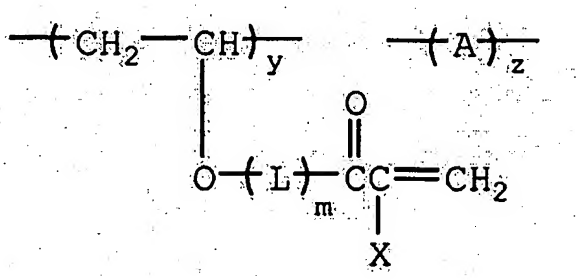




The $-(CF_2)_4-$ in the middle of the monomer of formula (16) of Yoshida, shown above, provides two repeat units of $-(CF_2-CF_2)-$ which is a homolog of the claimed fluorine-containing moiety of Applicant, shown below, with x =2.



The left portion of the monomer of formula (16) of Yoshida, shown above, is the claimed repeat unit of Applicant, shown below on the left, wherein y = 1, m = 0, X = H.



Yoshida teaches that the layer formed from the monomer has low refractive index, high surface hardness, and high adhesion (column 11, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a copolymer with formula 1 of Applicant, as the fluorine-containing polymer in the low refractive index layer of the antireflection film of Nakamura in view of Oka, in order to provide the desired high surface hardness and high adhesion, as taught by Yoshida.

5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Oka as applied to claims 15-18, 22-25, 27 above, and further in view of Yamaguchi (US 6,633,353) and Yang (US 6,181,400).

Nakamura in view of Oka, teaches a liquid crystal display device comprising a polarizing plate comprising a polarizer and two protective films of the polarizer, wherein one of the two protective films of the polarizer is the antireflection film described above. Nakamura in view of Oka fails to teach that the film other than the antireflection film of the two protective films of a polarizer is an optical compensation film having an optical compensation layer comprising an optically anisotropic layer, wherein the optically anisotropic layer is a layer having a negative birefringence and comprises a compound having a discotic structural unit, the disc plane of the discotic structural unit is inclined with respect to the surface protective film plane, and the angle made by the disc plane of the discotic structural unit and the surface protective film plane is changed in the depth direction of the optically anisotropic layer.

However, Yamaguchi teaches that the film other than the antireflection film of the two protective films of the polarizer is an optical compensation film (layer 12, column 7, lines 43-49), for the purpose of providing the desired optical compensation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided an optical compensation film as the film other than the antireflection film of the two protective films of the polarizer of Nakamura in view of Oka, in order to provide the desired optical compensation, as taught by Yamaguchi.

Nakamura in view of Oka and Yamaguchi, fails to teach that the optical compensation film comprises an optically anisotropic layer, wherein the layer has a negative birefringence and comprises a compound having a discotic structural unit, the disc plane of the discotic structural unit is inclined with respect to the surface protective film plane, and the angle made by the disc plane of the discotic structural unit and the surface protective film plane is changed in the depth direction of the optically anisotropic layer.

However, Yang teaches the use of an optical compensation film comprising an optically anisotropic layer which has negative birefringence, comprising a compound having a discotic structural unit, the disc plane of the discotic structural unit is inclined with respect to the surface protective film plane, and the angle made by the disc plane of the discotic structural unit is changed in the depth direction of the optically anisotropic layer discotic-type liquid crystalline film with negative birefringence (twist discotic-type liquid crystalline film with negative birefringence as a compensation film for a liquid crystal display, abstract), for the purpose of providing better view-angle characteristics, less color-shift and faster response times for the twisted liquid crystal display (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the optical compensation film of Yang as the optical compensation and protective film for the polarizer of Nakamura in view of Oka and Yamaguchi, in order to provide better view-angle characteristics, less color-shift and faster response times for a twisted liquid crystal display, as taught by Yang.

6. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Oka as applied to claims 15-18, 22-25, 27 above, and further in view of Yamaguchi (US 6,633,353).

Nakamura in view of Oka, teaches a liquid crystal display device comprising a polarizing plate comprising a polarizer and two protective films of the polarizer, wherein one of the two protective films of the polarizer is the antireflection film described above. Nakamura in view of Oka fails to disclose the mode or type of liquid crystal display device.

However, Yamaguchi teaches that a TN-mode reflective type (twisted nematic, column 5, lines 14-16) or STN-mode (super-twisted-nematic, column 5, lines 22-24) uses a polarizing plate comprising a polarizer with an antireflection film (polarizing film 10 subjected to anti-reflection treatment, column 7, lines 43-47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the polarizing plate comprising antireflection film of Nakamura in view of Oka, in a liquid crystal display device of the TN or STN-mode reflective type, in order to provide the desired mode and type of display, as taught by Yamaguchi.

Response to Arguments

7. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the cancellation of said claims, and the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

10/12/06

RENA DYE
SUPERVISORY PATENT EXAMINER

Tech Center 1700

10/12/06